

genesia Eaton, *Chankagensia* Buldovskii (= *Chankgenesia* Buldovskii), *Cheirogenesia* Demoulin, *Mortogenesia* Lestage, *Palingenia* Burmeister, *Plthoggenesia* Ulmer (= *Tritogenesia* Lestage).

Superfamily **PROSOPISTOMATOIDEA**, new rank (= Baetiseoidea)

Family **Baetiscidae**

Subfamily BAETISCINAE.—A single genus is included here: *Baetisca* Walsh.

Family **Prosopistomatidae** (= Binoculidae)

Subfamily PROSOPISTOMATINAE.—A single genus is included here: *Binoculus* Geoffroy (= *Prosopistoma* Latreille, *Chelysentomon* Joly and Joly).

TWO NEW CHIGGERS FROM THE CENTRAL STATES

(ACARINA, TROMBICULIDAE)^{1, 2}

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Investigations at the University of Kansas have disclosed two new species of chiggers belonging to the genus *Euschöngastia*. Both were taken from mammals inhabiting the short-grass prairies and canyons of the high plains region in the central states. These are summer chiggers and are known only from limited localities, as listed. Both species have been reared by one of us (Lipovsky) to the nymphal stage; descriptions of the nymphs will be published elsewhere.

In the following descriptions the terminology used is that of Wharton *et al.*, 1951. All measurements are in microns. Descriptions are based on the holotypes, with variations in the paratypes noted.

***Euschöngastia cynomyicola*, new species**

(Figs. 1-5)

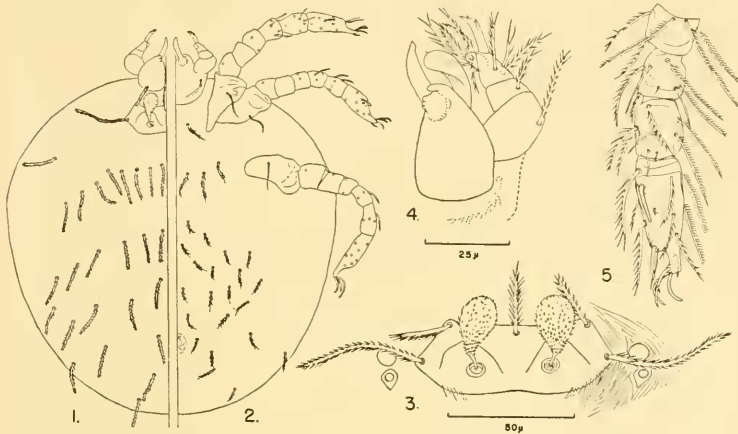
Diagnosis.—A *Euschöngastia* characterized as a larva by a trifurcate palpal claw, galeal seta with four or five branches, sensillae obovoid, two genualae I, subterminala and parasubterminala I present, tibiala III present, ventral setal formula beginning 2-6.

Body.—Shape almost spherical when engorged. Color in life, white. Length and width of body of holotype 369 by 341 (engorged). Eyes, two on each side; posterior eye smaller and situated on a plate apparently independently of anterior eye; distance across both eyes of one side 18, in holotype.

¹The studies upon which this paper is based were conducted under a contract, N6 ori 220 Task Order II, between the University of Kansas and the Office of Naval Research.

²Contribution No. 865 of the Department of Entomology, University of Kansas.

Dorsal setal formula approximately 2-16-12-10-6-2-2, total 50; humeral seta measures 41, anterior dorsal seta 32, posterior dorsal seta 30. Ventral setal formula 2-6-plus 42, total 50; anterior sternal seta measures 32, anterior ventral seta 18, posterior ventral seta 23. Total body setae approximately 100.



Euschöngastia cynomyicola, new species. Fig. 1, dorsal aspect of larva; fig. 2, ventral aspect of larva; fig. 3, scutum; fig. 4, dorsal aspect of gnathosoma; fig. 5, terminal segments of leg I.

Gnathosoma.—Cheliceral blade long, slender, slightly curved, and bearing a tricuspid cap; basal segment approximately two-thirds as long, punctate basally. Galeal seta with four to five branches. Capitular sternum with one pair of branched setae. Palpal femoral seta with approximately eight branches; dorsal tibial seta with approximately eight branches, lateral tibial seta nude or with one or two branches, ventral tibial seta with approximately twelve branches; tarsus with six (possibly seven) branched setae and a basal spur (7μ). Palpal claw with three prongs, the accessory prongs external or dorsal and in tandem.

Scutum.—Shape roughly rectangular, more than twice as wide as long, and pointed at the posterolateral corners; posterior margin slightly sinuous as illustrated, two ridges present, one anterior to each sensillary base; no punctae. Sensillae obovoid and with fine barbs. Scutal measurements of holotype: AW—57, PW—79, SB—33, ASB—20, PSB—14, AP—16, AM—28, AL—32, PL—57, S—32. Average and extremes of ten specimens (paratypes): AW—62 (56-69), PW—81 (76-89), SB—33 (30-35), ASB—22 (19-25), PSB—14 (13-15), AP—19 (18-21), AM—31 (29-32), AL—29 (26-32), PL—60 (55-67), S—33 (28-35).

Legs.—Branched leg setae of two types: Flexible setae with coarse setules, and stiff, rod-like setae with fine setules. Leg I coxa, trochanter, and basifemur each with one branched seta; telofemur with five branched setae, three with fine setules; genu with two genualae, one microgenuala, and four branched setae, two with fine setules; tibia with two tibialae, one microtibiala, and five branched setae, two with fine setules; tarsus with spur (15μ), microspur, subterminala, parasubterminala, pretarsala, and approximately eighteen branched setae, four with fine setules. Leg II coxa and trochanter each with one branched seta; basifemur with two branched setae, one with fine setules; telofemur with four branched setae, one with fine setules; genu with one genuala and three branched setae, one with fine setules; tibia with two tibiala and six branched setae, two with fine setules; tarsus with spur (14μ), microspur, pretarsala, and approximately fourteen branched setae, three with fine setules. Leg III coxa, trochanter, and basifemur each with one branched seta; telofemur with four branched setae, one with fine setules; genu with one genuala and three branched setae, one with fine setules; tibia with one tibiala and six branched setae, three with fine setules; tarsus with approximately sixteen branched setae, three with fine setules.

Type material.—Holotype, slide no. 7101, and 6 paratypes, nos. 7102-07, from 4 miles east of Stratton, Hitchcock County, Nebraska, found on 8 prairie dogs, *Cynomys ludovicianus* (Ord), field nos. RL490808-11 and RL490810-7, collected by Richard B. Loomis and Robert E. Elbel, August 8, 1949; and 5 paratypes, nos. 7108-12, from 13 miles south, 6 miles east of McDonald, Rawlins County, Kansas, found on 3 *Cynomys ludovicianus*, field no. RL490808-6, collected by Richard B. Loomis and Robert E. Elbel, August 8, 1949. The holotype and paratypes are deposited in the Snow Entomological Museum, University of Kansas. One paratype each will be sent to the United States National Museum, the Rocky Mountain Laboratory, the British Museum (Natural History), collection of Dr. G. W. Wharton, the South Australian Museum, Adelaide, and the Muséum National d'Histoire Naturelle, Paris, France.

Additional material examined.—The following larvae in the Snow Entomological Museum are referred to this species. KANSAS (Rawlins County): 13 mi. N. McDonald, *Perognathus hispidus*, July 28, 1948, KU slide no. 7113; 13 mi. N. 6 mi. E. McDonald, *Citellus tridcemlineatus*, August 7-8, 1949, KU 7114, and *Cynomys ludovicianus*, August 7-8, 1949, KU 7115-7116; 11 mi. S., 1 mi. E. McDonald, *Cynomys ludovicianus*, July 27, 1948, KU 7117.

Remarks.—The combination of a trifurcate palpal claw, sensillae obovoid, tibiala III present, and six setae in the second row of sternal setae will distinguish *Euschöngastia cynomyicola* from the other known species of the genus. The

affinities of this species are not clear; it appears closely related to *Euschöngastia samboni* (Radford, 1942) in the shape of the scutum and sensillae. Other species possibly related to *Euschöngastia cynomyicola* are *E. criceticola* Brennan, 1948, *E. cordircmus* Brennan, 1948, and *E. guntheri* (Radford, 1942).

***Euschöngastia loomisi*, new species³**

(Figs. 6-11)

Diagnosis.—A *Euschöngastia* characterized as a larva by a trifurcate palpal claw, galear seta nude, sensillae sub-capitate, four humeral setae, three genualae I, subterminala and parasubterminala I present, and tibiala III present.

Body.—Length and width of body of holotype 397 by 326 (engorged). Color in life, white to pale orange. Eyes, two on each side, posterior eye smaller; ocular plate apparently subdermal; distance across both eyes of one side 20 in holotype.

Dorsal setal formula approximately 4-12-4-8-6-8-8-4-2-2, total 58; humeral seta measures 30, anterior dorsal seta 25, posterior dorsal seta 25. Ventral setal formula approximately 2-2-12-12-8-8-4-2-2, total 52; anterior sternal seta measures 26, anterior ventral seta 17, posterior ventral seta 21. Total body setae approximately 110.

Gnathosoma.—Cheliceral blade slender, curved, bearing a tricuspid cap and an elongate, curved subapical ventral tooth as illustrated; basal segment stout, about two-thirds as wide as long, punctate basally. Galeal seta nude. Capitular sternum with one pair of branched setae. Palpal femoral seta with approximately six branches; genual seta with approximately four branches; dorsal tibial seta with approximately four branches, lateral tibial seta nude, ventral tibial seta with approximately four branches; tarsus with four branched setae and a basal spur (5 μ). Palpal claw with three prongs, the paired accessory prongs external or dorsal to the axial prong.

Scutum.—Shape roughly rectangular, less than twice as wide as long; posterior margin sinuous as illustrated; two ridges present, one anterior to each sensillary base; no punctae. Sensillae sub-capitate and with fine barbs. Scutal measurements of holotype: AW—45, PW—64, SB—11; ASB—21, PSB—11, AP—19, AM—26, AL—25, PL—32, S—22. Average and extremes of ten specimens (paratypes): AW—44 (42-26), PW—63 (59-65), SB—13 (11-15), ASB—22 (20-25), PSB—11 (9-13), AP—19 (16-20), AM—27 (25-32), AL—27 (25-32), PL—35 (28-39), S—24 (21-26).

Legs.—Leg I coxa, trochanter, and basifemur each with one branched seta; telofemur with five branched setae; genu with three genualae, one

³We take pleasure in naming this species in honor of Mr. Richard B. Loomis, our co-worker on the University of Kansas Chigger Project.

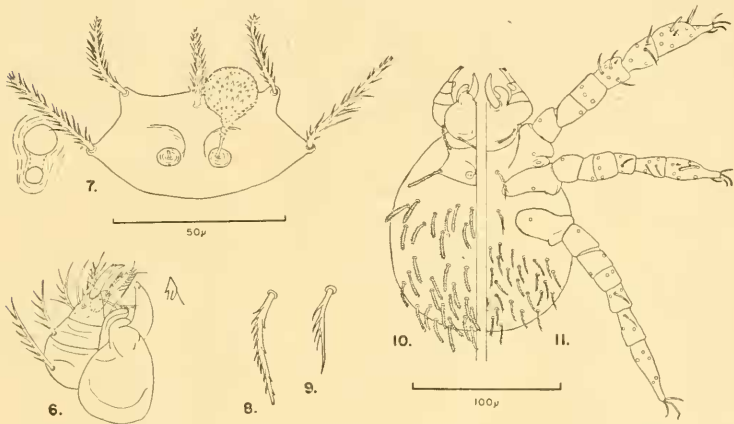
microgenuala, and five branched setae; tibia with two tibialae, one microtibiala, and eight branched setae; tarsus with a spur (11μ), microspur, subterminala, parasubterminala, pretarsala, and approximately nineteen branched setae. Leg II coxa and trochanter each with one branched seta; basifemur with two branched setae; telofemur with four branched setae; genu with one genuala and three branched setae; tibia with two tibialae and six branched setae; tarsus with a spur (13μ), microspur, pretarsala, and approximately sixteen branched setae. Leg III coxa and trochanter each with one branched seta; basifemur with two branched setae; telofemur with three branched setae; genu with one genuala and three branched setae; tibia with one tibiala and six branched setae; tarsus with approximately fourteen branched setae.

Type material.—Holotype, slide no. 7024, and twelve paratypes, nos. 7025-36, from ten and one-half miles west of Hardtner, Barber County, Kansas, found on an eastern cottontail, *Sylvilagus floridanus* (Allen), field no. RL520726-7, collected by Richard B. Loomis and D. A. Crossley, Jr., July 26, 1952; five paratypes, nos. 7037-41, from four miles south of Aetna, Barber County, Kansas, found on a silky pocket mouse, *Perognathus flavus* Baird, field no. RL520726-3, collected by Richard B. Loomis and D. A. Crossley, Jr., July 26, 1952; and ten paratypes, nos. 7042-51, from five miles south, four miles east of Aetna, Barber County, Kansas, found on two ord kangaroo rats, *Dipodomys ordi* Woodhouse, field no. RL490822-6, collected by Richard B. Loomis and Robert E. Elbel, August 22, 1949. The holotype and paratypes are deposited in the Snow Entomological Museum, University of Kansas. Two paratypes each will be sent to the United States National Museum, the Rocky Mountain Laboratory, the British Museum (Natural History), collection of Dr. G. W. Wharton, the South Australian Museum, Adelaide, the Muséum National d'Histoire Naturelle, Paris, France, collection of Dr. Charles D. Radford, the Army Medical Service Graduate School, Washington, D. C. and Dr. J. R. Audy, Institute for Medical Research, Kuala Lumpur, Malaya.

Additional material examined.—The following larvae in the Snow Entomological Museum are referred to this species: KANSAS (Barber County): 4 mi. S. Aetna, *Neotoma micropus*, August 22, 1949, KU slide nos. 7052-55, *Peromyscus leucopus*, July 25-26, 1952, KU 7056-59 and 7071-76, and August 23, 1949, KU 7060-64, *Peromyscus maniculatus*, October 7, 1951, KU 7065-70, *Perognathus flavus*, July 26, 1952, KU 7077 (4 specimens); 3 mi. S. Aetna, *Neotoma micropus*, July 25, 1952, KU 7078; 5 mi. S., 3 mi. E. Aetna, *Neotoma micropus*, July 25, 1952, KU 7086 (5 specimens); 5 mi. S. Sun City, *Sylvilagus floridanus*, September 12, 1948, KU 7089-93. OK-

LAHOMA (Woods County) : 7½ mi. S., 5 mi. E. Aetna, Kansas, *Perognathus hispidus*, July 26, 1952, KU 7094-95. TEXAS (Zavala County) : *Neotoma micropus*, August 20, 1952, KU 7096-7100.

Remarks.—*Euschöngastia loomisi* may be distinguished from all other known species of the genus by the combination of a trifurcate palpal claw, three genualae I, tibiala III present,



Euschöngastia loomisi, new species. Fig. 6, dorsal aspect of gnathosoma; fig. 7, scutum; fig. 8, anterior dorsal seta; fig. 9, anterior ventral seta; fig. 10, dorsal aspect of larva; fig. 11, ventral aspect of larva.

four humeral setae, and sensillae sub-capitate. The shape of the scutum, with the two scutal ridges and the sub-capitate sensillae, appears to be unique. The relationship of this species to other members of the genus *Euschöngastia* is obscure, due to the unique features of *E. loomisi* and to inadequate descriptions of some poorly known species; however, several characters of *E. loomisi* indicate similarity with *Pseudoschöngastia hungerfordi* Lipovsky, 1951. The ventral tooth of the chelicera, the shape of the sensillae, the shape of the anterior portion of the scutum, and the number and arrangement of the nude setae of leg I, possibly indicate a relationship between the two species. These similarities are worthy of note since the two species belong to different subfamilies. *Euschöngastia loomisi* (Subfamily Trombiculinae) having the femur of legs II and III divided into basifemur and telofemur, and *Pseudoschöngastia hungerfordi* (Subfamily Walchiinae) having the femoral segments of these legs undivided. Lipovsky,

1951, noted that some specimens of *Pseudoschöngastia* appear to have a vestige of this division, and Brennan, 1952 confirmed this observation but pointed out that "in no case are femur II and III segmentally divided in any species of *Pseudoschöngastia*." In *Euschöngastia loomisi* femur II and III are divided; however, this division is not pronounced, since at their unions the basifemur and telofemur are the same size and seem closely articulated. Careful observation is necessary to distinguish the external division. Brennan, 1952 further states, "It would appear that *Pseudoschöngastia* is a genus of considerable taxonomic interest and phylogenetic importance since obviously it represents a transitional group between the Trombiculinae and the Walchiinae." This statement is augmented by observations on *Euschöngastia loomisi*.

ACKNOWLEDGMENTS

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